

Using Research to Ensure Quality Teaching in Rural Schools

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The No Child Left Behind Act of 2001, requires increased accountability for states to guarantee that all teachers are "highly qualified" by 2005-2006. For rural schools that often struggle to attract and retain talented teachers, ensuring teacher quality calls for careful analyses of teacher quality data and innovative policies. This paper addresses the dilemmas of increasing teacher quality in states with large proportions of rural schools. It draws upon data from recent quantitative and qualitative studies on teacher recruitment, retention, and professional learning in Wyoming, one of the most rural states in the nation. It suggests a model for examining and building a comprehensive policy that ensures high-quality teaching in rural schools.

Teacher quality is at the center of the national education agenda for improving student achievement. The reauthorization of the Elementary and Secondary Education Act, the No Child Left Behind Act (NCLBA) of 2001, highlights what researchers have found and what parents have always known: that the quality of teaching matters (Darling-Hammond, 1997). The new Title II, Part A, program—Preparing, Training, and Recruiting Quality Teachers and Principals—consolidates the former Eisenhower Professional Development and the Class Size Reduction programs to allow for greater local control over funds aimed at raising student achievement by improving teacher quality through recruitment, retention, and professional development strategies. The law also mandates that all teachers must be "highly qualified" by 2005-2006. This means that only fully certified teachers or those who have passed a state licensing exam will be allowed to teach in public school classrooms. This national focus on teacher quality stems from heightened requirements for student achievement of standards and school accountability.

Increased achievement and accountability requirements intensify interest in factors that improve student achievement. Standards-based reforms also have been shown to augment the expectations for what teachers need to know and be able to do in terms of both quantity and complexity. These reforms place demands on teachers' subject-matter knowledge and pedagogical skills; understanding of cultural and psychological factors that affect student learning; and responsibilities for curriculum, assessment, outreach, governance, and interagency collaboration (Corcoran, 1995). A growing body of research has demonstrated that the most important school factor in affecting student learn-

ing is the level of a teacher's expertise (Ferguson, 1991; Greenwald, Hedges, & Laine, 1996; Sanders & Rivers, 1996; Wenglinsky, 2000). In fact, the effects of differences in teacher expertise have been shown to be cumulative and exacerbated over time. Sanders and Rivers (1996) found that Tennessee elementary students who were assigned to ineffective teachers for 3 consecutive years scored significantly lower on achievement tests than those students assigned to the most effective teachers over the same period. Although the most productive investment in raising student achievement is increasing teacher education and professional development (Ferguson, 1991; Greenwald et al., 1996), most school schedules do not normally incorporate the amount of time needed for teachers to understand and implement effective reform initiatives in the classroom (National Commission on Time and Learning, 1994). Yet, the success of standards-based reform depends on the expertise of teachers to effectively instruct, guide, and inspire students to learn.

Raising teacher quality as a means of improving student learning and school accountability requires an adequate supply of high quality teachers. National media attention on teacher quality has focused predominately on teacher shortages and accelerated alternative teacher certification programs, particularly for urban schools. However, rural schools face challenges in attracting certified teachers to communities where medical services, entertainment, and other amenities are limited and often nonexistent (Ballou & Podgursky, 1995; Larsen, 1993). Rural and small schools often need teachers who are certified in multiple subject areas (Lemke, 1994; Stone, 1990), increasing the level of knowledge and skills required for teachers to be fully certified and considered highly qualified, according to the requirements of the new federal law. Rural schools also struggle to retain certified teachers. Without an adequate supply of fully certified teachers, school districts are forced to hire less qualified applicants (Lippman, Burns, & McArthur, 1996).

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Yet, increasing the number of fully certified teachers will not alone guarantee high quality teaching. Stigler and Hiebert (1999) argue that "If we hope to improve the practice of the profession, it is the standard, common practice that must improve" (p. 175). Advancing "standard practice" requires building teacher capacity to promote student learning to high standards on a large-scale basis. Although "capacity building" is becoming a cliché within the education community, clearly defining what capacities teachers need to successfully promote learning and how these can be developed are key factors in understanding the role of teachers in school improvement efforts. The National Staff Development Council has defined effective professional development as long term, focused on learning in collaboration with colleagues, and integrated in professional work settings. Rural and small schools often have limited resources to provide effective professional development that supports teacher capacity building (Khattari, Riley, & Kane, 1997).

For rural states to meet the accountability requirements for teachers in the NCLBA, systematic research on both teacher supply and efforts to build teacher capacity must be conducted. This effort needs to go beyond simple state averages or analyses of teacher shortage areas. It must examine the complexities of teacher recruitment, retention, and professional development in order to build a comprehensive policy for ensuring high-quality teaching in rural schools.

This article outlines the complex issues that every state faces in relation to teacher quality issues. Yet it draws upon teacher quality data from one of the most rural states, Wyoming, to present the dilemmas of increasing teacher quality for rural schools. I begin with a brief description of the context for the article and methods used to analyze the studies on which it is based. This is followed by a presentation of findings and corresponding policy recommendations organized according to three major themes in the literature on teacher quality: recruitment, retention, and professional learning. I conclude by presenting a model for building a comprehensive policy to ensure high-quality teaching in rural schools.

Context and Method

As the least-populated state, Wyoming has fewer than 500,000 people and fewer than five people per square mile. Since 1995, Wyoming has experienced net out-migration. This trend is forecasted to continue through 2008 (Manley, 2000). The K-16 education system includes one 4-year university, 7 community colleges, and 48 school districts that employed approximately 6,753 full-time, certified teachers in 2000-2001. Overall, 80% of Wyoming schools are located in areas designated as rural or small town, and these schools are responsible for educating 69% of the

state's students (Reichardt, 2001a). Wyoming has a growing number of retiring teachers and rigorous student academic standards.

A number of studies have investigated issues of supply, demand, compensation, certification, and professional development in Wyoming (Holloway, 2001, 2002; Manley, 1998, 2000; Paradis & Stone, 2000; Reichardt, 2001a, 2001b; Sachse & Manley, 1999; Smith, 2001; Wolkoff & Podgursky, 2001). These studies take both quantitative and qualitative approaches to understanding policies and practices aimed at recruitment, retention, and professional development of beginning and career teachers.

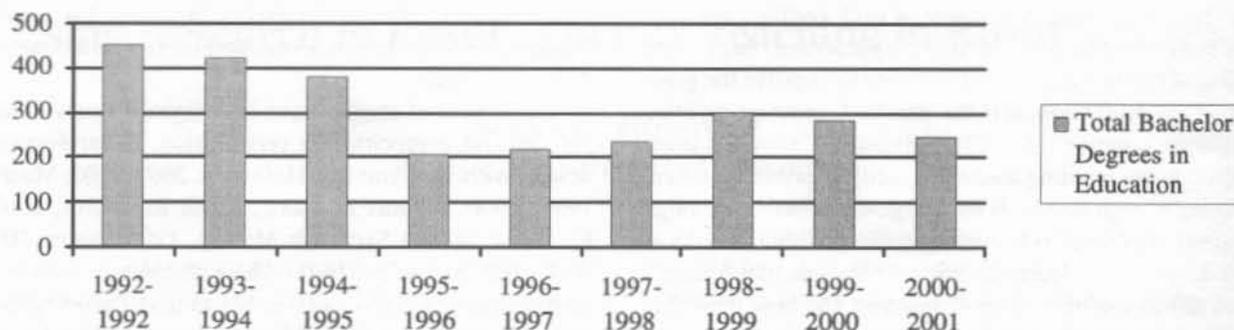
To analyze these studies, data first were compared by region and locale within Wyoming. This comparison allowed for more complex analyses than simply examining state-level averages. Regional and locale trends also enable policymakers to construct policies that support teacher quality initiatives in schools that are most in need. Five regions of the state were defined as Central, Northeast, Northwest, Southeast, and Southwest. These regions are county-based and are used by the Wyoming Department of Employment, Research & Planning (2000). Three kinds of locales were defined as cities/large towns, small towns, and rural.¹ Each Wyoming school district was considered to be located in one of these categories based on the locale in which the majority of the district's teachers work.

Second, findings were compared across studies and categorized according to a framework consisting of four predominant issues in the literature on teacher quality: recruitment, retention, and professional learning. This framework provided a model for examining the complexities of teacher supply, demand, and capacity building and for developing a comprehensive policy for ensuring high-quality teaching in rural schools.

Recruitment

Warnings about increasing teacher shortages were issued during the 1990s by the U.S. Department of Education, which estimated that two million new teachers would be needed over the next decade due to increasing student enrollments, new laws requiring smaller class sizes, and expected retirements. However, researchers argue that the shortage is not simply the result of an insufficient number of qualified teachers to fill the number of vacancies. In fact, there is an overall surplus of certified teachers nationally (Darling-Hammond, 2000). The issue of teacher shortages is much more complex than simply matching qualified candidates with job openings; it is a matter of distribution of teachers who are qualified and willing to teach in high-

¹The U.S. Department of Education in the Common Core of Data provides a school locale code for all public schools based on population density.



Source: University of Wyoming (2001, <http://uwyo.edu/instana/degrees.htm>)

Figure 1. Total UW bachelor degrees in education

need schools, especially rural schools and urban areas with high proportions of low-income and minority students. Shortages also tend to exist in particular specialty areas and are often caused by high rates of turnover among novice teachers. Addressing exiting teacher shortages by simply recruiting more candidates into the teaching profession may do little to increase the supply of high-quality teachers. To better understand the complexities of teacher shortages for rural schools, consider the following data from Wyoming.

Teacher Supply

Most states experiencing teacher shortages have school-age populations that are on a steep incline, with large and growing percentages of low-income, minority, and English language learners. Wyoming, conversely, is experiencing a declining student population that is predicted to persist through 2008. Public school enrollment is less than 88,000 students in grades kindergarten through twelve. Since 1993, elementary school enrollment has dropped by over 17%, and junior high school enrollment decreased about 10%. High school enrollment has had a slight increase of about 3% (Reichardt, 2001a) but is predicted to drop as current high school students move out of the system. Between 2000 and 2008, student populations are predicted to drop by 21% for 15- to 19-year-old students and by 16% for student's age 10 to 14 years. In comparison to other more urban states in the region, Wyoming also has relatively low percentages of minority, English language learners, and free-and-reduced-lunch eligible students (Smith, 2001).

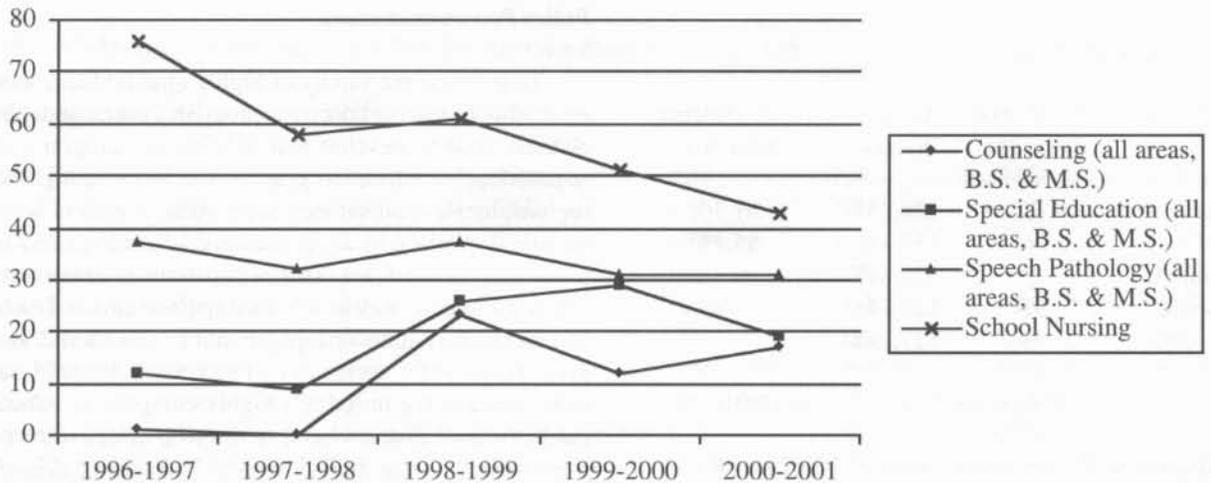
In spite of declining student populations, there have been only small shifts in the distribution of full-time teachers since 1993 (Reichardt, 2001a). In fact, the number of full-time teachers in elementary and middle level grades

has remained relatively steady while the number of high school teachers rose. As a result, the student-to-teacher ratio declined by 19% since 1993, largely due to decreasing enrollments. Student-to-teacher ratio is a statistic that most states use to characterize teachers' working conditions. It provides an indicator of student load that is comparable across states. The average student-to-teacher ratio in Wyoming is currently 13 students for each certified staff member (Reichardt, 2001a; Smith, 2001).² This ratio is consistently lower in rural districts, decreasing from 11.9 in 1993 to 10.3 in 2000 (Reichardt, 2001a). Wyoming's student-to-teacher ratio is lower than surrounding states and is considerably lower than the U.S. average (16.1) as well.³ However, when comparing Wyoming student achievement on the National Assessment of Educational Progress to that of other regional and rural states (Smith, 2001), a smaller student-to-teacher ratio in Wyoming schools does not appear to put Wyoming students at an achievement advantage.

The 1999-2000 school year was the first time Wyoming districts reported teacher shortages. These shortages were in specific areas, such as special education, foreign language, bilingual, math, science, vocational, music, gifted and talented, psychology, and counseling (Manley, 2000).

²Student-to-teacher ratios account for all certified staff, including special subject teachers, special educators, and principals. Actual class sizes in larger districts are often higher than this ratio. Also, this figure does not take into account the multiple-subject preparations that teachers in small schools are likely to have.

³In 2000, Nebraska's student-to-teacher ratio was closest to Wyoming's (13) with 13.9, followed by South Dakota (14), Montana (15.2), the U. S. average (16.1), Colorado (17.4), Idaho (18), and Utah (22) (Smith, 2001).



Source: University of Wyoming (2001, <http://uwyo.edu/instana/degrees.htm>)

Figure 2. UW degrees in special education and student services

At the beginning of the 2000-2001 school year, 49 teaching positions were unfilled in schools. Thirty-three were classroom positions, and 16 were positions outside the classroom with the majority (15.5) in student service areas (e.g., counseling, psychology, and speech pathology). Vacancies in student services areas represented 2.5% of student services positions. Foreign language had the highest proportion of vacant positions with 2.6% of all positions in the foreign languages. All other classroom areas with vacancies represented 1% or less of the positions in those areas. The highest concentrations of vacancies were in rural schools and schools in the western part of the state, those areas experiencing population declines for the past 10 years (Holloway, 2002). At the beginning of the 2001-2002 school year, 47 positions were unfilled. Thirty-eight percent of the unfilled positions were in special education, speech pathology, and counseling/social work combined. Although the overall numbers are small, these indicators suggest that the supply of qualified teachers in specific student service areas, in rural and small town schools, and in schools in the western part of the state was insufficient to meet the rising demand. This recent emergence of teacher supply and recruitment issues in Wyoming reflects regional and national trends (Ballou & Podgursky, 1995; Larsen, 1993).

Over the past 9 years, the supply of Wyoming educators produced by the University of Wyoming College of Education, the only teacher education institution in the state, clearly has declined (see Figure 1). Of greatest concern is the small number of graduates in student services and special education fields, especially speech pathology and counseling (see Figure 2).

District Recruitment Practices

The decreasing number of teachers generated in-state and the increased demand for teachers in regional states and nationally makes district recruitment of teachers more challenging in Wyoming. For the 2001-2002 school year, Wyoming districts hired 767.6 teachers. In the spring of 2001, 21 Wyoming districts (44%) attended the only in-state teacher fair at the University of Wyoming. Twelve of these same districts attended this fair the previous year. Since its inception in 1998, this teacher fair has attracted an increasing number of out-of-state districts experiencing severe teacher shortages, especially those in large urban areas and with high proportions of minority, English language learner, and low-income students. The number of Wyoming districts attending the fair since 1998 has remained relatively steady; however, their proportion in relation to the number of out-of-state districts attending has decreased from 56% in 1998 to 18% in 2001 (University of Wyoming Career Services, 2001). The increasing number of out-of-state districts recruiting in Wyoming reflects the rising demand for teachers nationally.

In November 2001, University of Wyoming Career Services surveyed all 117 districts that attended the 2001 fair. Thirty-nine districts, 33%, reported whether they had hired candidates from the fair, in what positions, and at what salary level. Table 1 presents the results of this survey for those districts with which Wyoming is in greatest competition for hiring its in-state teacher candidates: Arizona, Texas, Nevada, and Colorado. Half of the Arizona districts that attended the fair (6) hired a total of 15 fair

Table 1
UW Career Fair Hires

| Districts in | Number of Positions | Average Salary | Net Difference from WY |
|--------------|---------------------|----------------|------------------------|
| Arizona | 15 | \$28,753 | \$1,561 |
| Texas | 6 | \$32,425 | \$5,233 |
| Nevada | 2 | \$26,847 | (\$345) |
| Colorado | 31 | \$27,248 | \$56 |
| Wyoming | 38 | \$27,192 | |

Source: University of Wyoming Career Services (2001)

participants with an average salary of \$28,753. Of the 12 districts from Texas that attended, four reported hiring 6 participants at the highest average salary (\$32,425) among comparison states. Two participants were hired by the Clark County School District in Las Vegas, Nevada, at \$26,847 each, \$345 less than they would have earned on average in Wyoming. Most surprisingly, 10 Wyoming districts reported hiring 38 participants with an average salary of \$27,192, only \$56 less than the average salary of new Colorado hires from the fair (\$27,248). At the same time, unlike these comparison states, Wyoming has no income tax, a moderate sales tax, and minimal property taxes.

Many larger and more urban districts attending this fair and across the county are offering candidates in high-need subject areas additional financial incentives, such as signing bonus, differential salary scales, moving expenses, and/or additional insurance and retirement benefits. For new teachers graduating from teacher certification programs with increasing debt loads, these kinds of incentives can be quite attractive. Half of Wyoming districts make these kinds of offers. Twelve districts offer bonus pay or improved salary, seven make moving expenses available, and four increase insurance or retirement benefits for teachers in specific areas of need.

Despite the reports from Wyoming school districts of unfilled positions for the 2001-2002 school year, 40% of Wyoming districts (19) did not attend a single recruiting fair that year (Wyoming Professional Teaching Standards Board, 2001). The number of recruiting fairs any single district attended ranged from six fairs (3 districts) to one (12 districts). The districts that attended at least one fair went to an average of less than three fairs, and all fairs attended were in Wyoming or surrounding states. These data indicate that Wyoming districts tend to recruit personnel from surrounding states and that they do so on a limited basis despite reports of increased difficulty in hiring teachers in comparison to 5 years prior (Wolkoff & Podgursky, 2001).

Policy Recommendations

To increase the supply of highly qualified teachers in rural schools, teacher education programs, states, and school districts need to develop loan forgiveness programs that require teacher education graduates to work in high-need regions, locales and subject areas, such as student service areas and special education. Incentives for adequately prepared individuals from other occupations to enter certification programs, such as scholarship programs and district and community sponsorships, should be considered. However, in addition to these kinds of incentives, for rural states to be competitive in today's highly competitive educator market school districts need to develop effective recruitment strategies that appeal to today's teacher candidates, such as attending fairs with attractive displays, informative materials, and defined salaries and positions. Districts also need to consider offering incentives, like signing bonuses, moving expenses, education reimbursements, and housing assistance that other newly hired professionals have come to expect. The smallest and most rural districts may need to form consortia of human resource managers to develop shared recruitment strategies, internship, and paid positions, especially in student service areas.

Retention

Retaining high quality teachers in the classroom is one of the biggest obstacles to addressing teacher shortages. Nationally, 30% to 50% of teachers leave the profession in their first 5 years of teaching (Boser, 2000; Hare & Heap, 2001a). Additionally, the teaching profession offers few avenues for promotion that allow our best teachers to remain in the classroom. Teachers who seek career opportunity and salary advancement are encouraged to leave the classroom for administrative positions or other occupations. Ingersoll (1997) has argued that school staffing problems are caused not so much by an insufficient supply of qualified teachers but by "too many teachers leaving teaching" (p. 2). Hare and Heap (2001b) report that a majority of Midwestern superintendents interviewed suggested that from 75% to 100% of teachers leaving the classroom are "highly effective" or "effective."

Teacher turnover is problematic for two reasons. Not only does it require enormous resources and energy to recruit new teachers to replace those leaving the classroom, but it also requires districts to expand additional resources and energy to develop new teachers' knowledge and skills—new teachers "who are likely to leave after only a few years and be replaced by yet another recruit in need of special resources and support" (National Association of State Boards of Education, 1998, p. 7). Thus, teacher turnover also has serious implications for school improvement efforts and student learning as well. Ingersoll (2001) argues,

Table 2
1996-1999 Average District and State Teacher Attrition Rates by Age Group

| Age Group | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 1996-1999 |
|-----------|------|------|------|------|------|-------|-----------|
| Under 25 | 15% | 21% | 22% | 26% | 22% | 23% | 23.5% |
| 26 to 30 | 13% | 13% | 16% | 15% | 18% | 17% | 16.5% |
| 31 to 35 | 8% | 8% | 11% | 11% | 11% | 12% | 11.1% |
| 36 to 40 | 6% | 6% | 6% | 6% | 7% | 8% | 6.8% |
| 41 to 45 | 4% | 6% | 5% | 5% | 5% | 7% | 5.7% |
| 46 to 50 | 4% | 5% | 5% | 5% | 6% | 6% | 5.4% |
| 51 to 55 | 5% | 9% | 8% | 7% | 8% | 10% | 8.5% |
| 56 to 60 | 16% | 16% | 17% | 19% | 17% | 20% | 18.2% |
| 61 to 65 | 34% | 42% | 38% | 42% | 38% | 38% | 39.3% |
| 66 to 70 | 50% | 63% | 20% | 14% | 25% | 20% | 19.8% |
| Total | 7.1% | 8.3% | 8.9% | 8.7% | 9.5% | 10.8% | 9.5% |

Source: Reichardt (2001a)

"teacher recruitment programs alone will not solve the staffing problems of schools if they do not also address the organizational sources of low retention" (p. 501). Thus, teacher turnover drives demand for teachers.

Teacher attrition is primarily attributed to job dissatisfaction due to low salaries and lack of support (Ingersoll, 2000, 2001). Teachers in rural schools are more likely to cite social, geographic, cultural, and professional isolation as reasons for leaving than teachers in others contexts (Collins, 1999). Murphy and Angelski (1996/1997) conducted a survey of teacher mobility in rural British Columbia and found that teacher attrition was due to geographic isolation, weather, distance from larger communities and family, and inadequate shopping (Murphy & Angelski, 1996/1997). They also found that teachers remain in rural teaching positions due to their principal, spouse employment in the community, and satisfaction with rural lifestyle.

As is the case in other states, discussion about teacher retention in Wyoming has revolved largely around the issue of teacher salaries (Wyoming Education Coalition, 2000, 2001). Ballou and Podgursky (1995) report that rural teachers earn significantly lower salaries than those paid to nonrural teachers. However, a complicated relationship between rates of turnover and salaries exists.

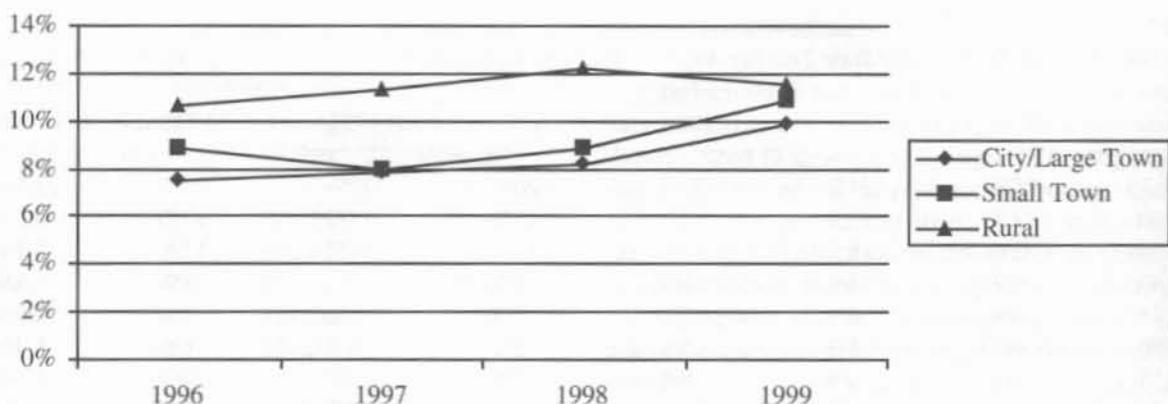
Teacher Demand Driven by Turnover

Data on turnover were broken down into two main categories: general attrition, which includes educators who left a full-time position held the year before, and transfers, which includes teachers who left a full-time position in one district and took a full-time position in another district the following year. Attrition and transfer data have important

implications for teacher supply and the strategies districts use to retain educators.

Overall teacher attrition from Wyoming schools has increased from 7% in 1994-1995 to almost 11% in 1999-2000. Since 1996, the average number of years until retirement for teachers has decreased from 14.4 to 13.5 years. Teachers in rural areas are younger and thus furthest away from retirement (15 years). Future increases in teacher retirements will likely raise attrition rates and the number of novice teachers hired. Wyoming educators are eligible for retirement at age 60 or by meeting the Rule of 85—when age plus years of experience equals 85. Table 2 demonstrates that attrition is highest for those teachers nearing retirement age and for new teachers under 25 years of age. Attrition for beginning teachers is about 23%. However, the attrition rate has increased for every age group. Attrition rates are generally higher for special educators than any other teaching area. Special education and elementary education teachers also are most likely to pursue administrative positions (Reichardt, 2001b). Figure 3 shows that small town districts experienced the largest proportional increase in attrition, followed by city/large town and rural districts. While teacher attrition increase in all regions, it was highest in western areas of the state (see Figure 4).

When a teacher transfers from one district to another, it is considered a "quit" to the district that lost the teacher. Thus, transfers are a form of attrition that indicate competition among districts. Examining transfers identifies areas that have higher demand for teachers. Conversely, districts that hire many transfers from other districts may have fewer supply issues due to their ability to attract teachers from other in-state districts. The number of teachers who transfer from one district to another within Wyoming in any



Source: Reichardt (2001a)

Figure 3. Teacher attrition rates by locale

single year is relatively low, falling between 57 and 101 teachers (Reichardt, 2001a). However, transfers occur most often among younger teachers. This is also found in other studies (see Murnane, Singer, & Willitt, 1989). When looking at only the youngest teachers, the rate of transfer ranges from 3% to 7% per year.

Table 3 demonstrates that teachers also are transferring from rural schools to schools located in cities/large towns. Each cell in the table shows the net flow from a locale (i.e., transfers in minus transfers out). A negative number indicates that more teachers moved out of a particular locale than into it. For example, between 1996 and 1997, six more teachers transferred out of rural districts than into rural districts. This flow represents a movement of knowledge, skills, and experience out of rural schools. Similar calculations are shown for regional transfer in Table 4. This clearly shows that teachers are transferring from schools in western districts and are transferring into schools located in central and eastern districts, where larger towns are located.

Teacher Salaries

Higher salaries often are advocated to reduce teacher turnover. Wyoming school district personnel believe the most common problem in retaining teachers is "non-competitive salaries," according to the 2000 and 2001 Fall Staffing Surveys conducted by the Wyoming Professional Teaching Standards Board. National studies of compensation (American Federation of Teachers, 2001) have documented the decline of Wyoming's average teacher salary rankings in comparison with other states, many of which are in the midst of prolonged teacher shortages.

For the 2000-2001 school year, Wyoming's average total salary for a full-time teacher was \$35,979⁴, not including benefits. Table 5 presents average teacher salaries for all teachers, teachers with no experience in Wyoming without a master's degree, and teachers with 18 years of in-state experience with a master's degree. The average salary for beginning teachers was \$25,439. In 2000-2001, beginning teachers were, on average, highest paid in rural areas and in the Southeast. These areas also had the highest proportion of novice teachers (16%). Cities/large towns and the central region of the state paid beginning teachers the least and experienced teachers (18 years with a master's degree) the most.

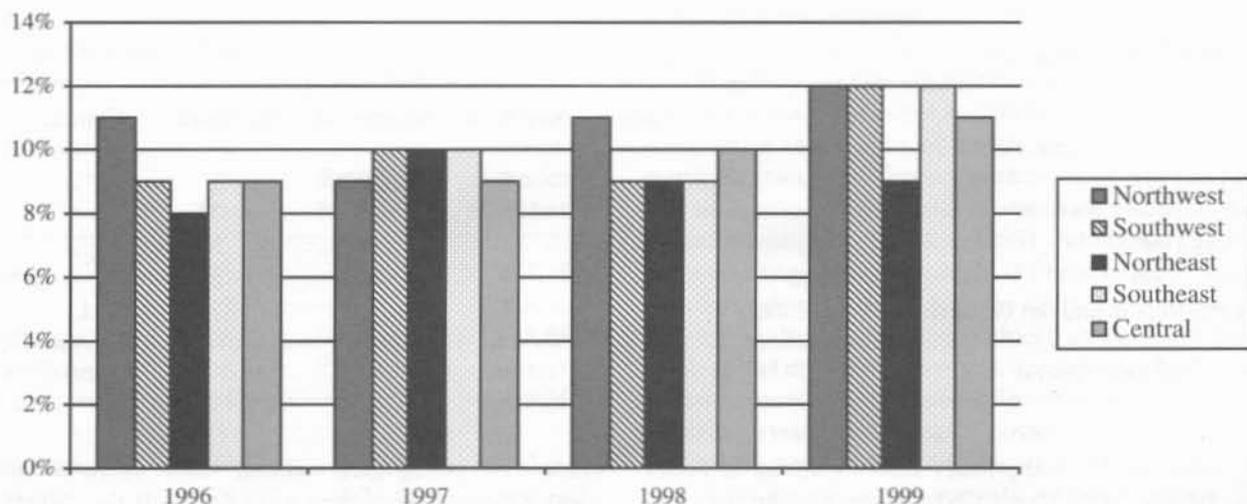
Reichardt (2001a) and Wolkoff and Podgursky (2001) found that compensation for experienced teachers in Wyo-

Table 3
Flow of Teachers Between Locale

| | City/Large Town | Small Town | Rural |
|--|-----------------|------------|-------|
| 1996 to 1997 | 4 | 2 | -6 |
| 1997 to 1998 | 17 | 4 | -21 |
| 1998 to 1999 | 9 | 0 | -10 |
| 1999 to 2000 | 18 | 0 | -18 |
| Net transfers in and out between 1996 and 2000 | 48 | 6 | -55 |

Note. Table does not sum to zero due to missing data on school locale.

Source: Reichardt (2001a)



Source: Reichardt (2001a)

Figure 4. Teacher attrition by region

ming is competitive with teacher salaries in adjoining states and with nonteaching occupations in Wyoming. Compared to adjoining states, those from which most districts recruit out-of-state teachers (see District Recruitment Practices), Wyoming gave larger percentage pay increases to experienced teachers as compared to beginning teachers from 1997 to 2000. Until 2001-2002, earnings of experienced teachers in Wyoming grew faster than the national or Wyoming rate of inflation and Wyoming manufacturing earnings. For this same period, earnings for beginning teachers grew slower than the rate of inflation and Wyoming manufacturing earnings (Wolkoff & Podgursky). Wolkoff and Podgursky also found that 1997 University of Wyoming graduates earned less as teachers in Wyoming than in Colorado, but they earned more than teachers in South Dakota and Utah. University of Wyoming graduates who taught in Wyoming were shown to earn 98% of nonteaching annual earnings in 1999. This means that in 9 months, teachers earned almost as much as other workers in Wyoming over the course of 12 months. On the other hand, University of Wyoming graduates who took teaching positions in one of the other three states earned 77% of 1999 nonteaching annual earnings in those states.

In the 2001 legislative session, the Wyoming legislature passed a 9.44% increase in state education funding for teacher salaries. This increase produced the largest teacher

salary hike since 1997 in Wyoming and in adjoining states, and the highest teacher salary increased in the nation for the 2001-2002 school year (National Education Association, 2002). This single year boost in salaries exceeded Wyoming's cumulative 3-year increases (1997-2000), and it was higher for beginning teachers than for experienced teachers or administrators (Wolkoff & Podgursky, 2001).

Prior to 2001-2002, the most significant salary increase statewide was between 1997 and 1998. Despite this increase, overall teacher attrition continued its upward climb. When comparing like groups of teachers (e.g., beginning teachers with no experience), salaries increased by 5.9% between 1997 and 1998, while attrition rates remained 20%. These data demonstrate that there may be limitations to using salary increases to reduce attrition, especially in rural areas where beginning teacher salaries are highest. Subsequent data collection and analysis is required to assess the impact of the 2001-2002 salary increases on turnover rates.

Additionally, teachers in Wyoming do not appear to be making career decisions based on the prospect of increased salary. Teachers who leave Wyoming to teach in schools in Colorado, South Dakota, or Utah earn less than when they taught in Wyoming (Wolkoff & Podgursky, 2001). Also, beginning teachers earn less 1 year after transferring from one Wyoming district to another (Reichardt, 2001a). Between the 1998-1999 and 1999-2000 school years, average total salaries in Wyoming increased \$1,710 for teachers with less than 5 years experience who stayed in the same district as compared to the \$218 increase for similar teachers who transferred (Reichardt, 2001a). Similarly, Hanushek, Kain, and Rifkin (2001) studied the ca-

⁴Total salaries include compensation for all teaching assignments and additional duties that augment teachers' primary contracted duties and for which they receive additional compensation. All salary data are based on full-time teacher total compensation.

Table 4
Regional Flow of Teachers

| | Northwest | Northeast | Southwest | Southeast | Central |
|--|-----------|-----------|-----------|-----------|---------|
| 1996 to 1997 | -7 | 5 | -3 | 2 | 3 |
| 1997 to 1998 | -3 | -2 | -7 | 7 | 5 |
| 1998 to 1999 | -5 | 7 | -10 | 5 | 3 |
| 1999 to 2000 | 6 | -3 | -15 | 8 | 4 |
| Net transfers in and out between 1996 and 2000 | -9 | 7 | -35 | 22 | 15 |

Source: Reichardt (2001a)

reer moves of 375,000 primary school teachers in Texas from 1993 to 1996. They found that teachers, for the most part, moved to classroom jobs which paid only slightly more than they had been earning but were in schools with higher test scores, fewer minority students, and smaller percentages of low-income students. Thus teachers who transferred do not necessarily do so for increased salaries.

Knowledge and Skills-Based Pay

Based on research that supports the link between teacher expertise and student performance, the National Commission on Teaching and America's Future recommends that states and districts consider better ways of linking pay to the development of teacher knowledge and skills as a means of attracting and retaining high quality teachers (Darling-Hammond, 1997). Exploring better ways of using pay to enhance teacher retention is also supported, to varying degrees, by education unions and associations nationally.

Knowledge- and skills-based compensation systems have emerged as a potentially promising way to leverage investments in increased teacher pay to improve recruitment, retention, teacher expertise, and learning. Knowledge- and skills-based compensation systems are intended to reinforce an organizational culture that values teacher growth (Lawler, 2000) and to create a clear career path linked with increasing professional expertise (Heneman & Ledford, 1998; Heneman, Ledford, & Gersham, 2000). Such pay systems provide clear directions to teachers about how they should focus their professional energies and reward teachers with base pay increases or bonuses for acquiring demonstrated knowledge, skills, and completing additional professional services needed to meet education goals. In the 1990s some states and districts implemented compensation systems that rewarded educators for knowledge, skills, and professional contribution to the improvement of student achievement. When these approaches were combined with sufficient standards-based professional learning opportunities—such as mentoring, study groups, and

content and pedagogical training—these career advancement programs have been shown to shift the culture of schools to focus on the teaching and learning of both students and teachers (Odden & Kelley, 2001).

Odden, Kelley, Heneman, and Milanowski (2001) reported that a common way to supplement the traditional salary schedule is to provide a bonus or base-pay increases for certification by the National Board for Professional Teaching Standards (NBPTS). In Wyoming 10 districts reward teachers for achieving NBPTS certification. Four districts offer bonus pay of \$2,000 to \$3,000, and six award increases on the salary schedule, such as doctorate level (Wyoming Professional Teaching Standards Board, 2001). Another approach is to reward teachers for completing a block of courses that directly relate to improving student achievement in relation to district and school goals. One Wyoming district has implemented this kind of program. Often completion of such skill blocks is considered part of induction as well as ongoing professional development. For a complete review of the various national programs see Odden and Kelley (2001).

High-Quality Induction and Mentoring Programs

The growing number of novice teachers and their high attrition rates have led to an increased interest in providing on-site support and assistance to novices during their first years of teaching (Little, 1990). Over 30 states have mandated some form of mentored induction for beginning teachers. Induction programs commonly incorporate orientation workshops to help novices assimilate into the school environment and ongoing mentoring. Mentoring programs that pair novice educators with outstanding experienced educators who explain school policies and practices, share methods and materials, and help solve problems improve the quality of teaching, teacher leadership, and learning. Mentors guide the professional growth of new teachers by promoting reflection and fostering the norms of collaboration and shared inquiry (Feiman-Nemser & Parker, 1993). Research on mentoring has shown that protégé benefits in-

Table 5
Average Salaries in 2000

| | All Teachers | No State Experience, No Master's | 18 Years State Experience With Master's |
|-----------------|--------------|----------------------------------|---|
| Average | \$ 35,979 | \$ 25,439 | \$ 44,355 |
| City/Large Town | \$ 36,979 | \$ 24,569 | \$ 45,668 |
| Small Town | \$ 36,383 | \$ 25,591 | \$ 44,151 |
| Rural | \$ 34,101 | \$ 25,964 | \$ 42,264 |
| Northwest | \$ 34,346 | \$ 25,554 | \$ 42,606 |
| Northeast | \$ 35,987 | \$ 25,682 | \$ 44,350 |
| Southwest | \$ 36,960 | \$ 25,818 | \$ 45,012 |
| Southeast | \$ 36,119 | \$ 25,923 | \$ 42,761 |
| Central | \$ 36,340 | \$ 23,787 | \$ 46,282 |

Source: Reichardt (2001a)

clude faster assimilation into the school environment, establishment of professional competence, and introduction to teaching as a continually developing career (Evenson, 1982). Mentors gain the experience of reflecting on their accumulated professional practice to exchange knowledge and skills with a protégé (California State Board of Education, 1983; Krupp, 1984). Characteristics of effective mentoring programs include training and compensation for mentors as well as release time for both mentors and protégés to meet and observe each other's classrooms. Rural schools often face unique challenges when designing mentoring programs. Few teacher education programs, even those located in rural areas, specifically prepare teachers for rural schools (Hersh, Stroot, & Snyder, 1995/1996).

The Wyoming Professional Teaching Standards Board 2001 Fall Staffing Survey revealed that 35 of 48 Wyoming school districts (76%) had an induction program for new teachers, and 28 (58%) of these included mentors. When Wyoming districts indicated the components included in their induction/mentor programs, just over half of the districts that have mentor programs offered mentor stipends (15). Forty-two percent of these districts incorporated mentor training (12), 32% provided release time for protégés, and only a quarter granted mentor release time to work with protégés (7). For teachers, especially in rural areas, additional support to increase rates of retention and effectiveness are necessary. Strong induction and mentoring programs may help attract candidates for vacant positions in high-need districts, ensure their effectiveness, and keep them there.

Policy Recommendations

To reduce attrition among beginning and career teachers in rural schools, salaries need to be maintained at a level competitive in all areas of a state and with surrounding states. Kentucky and Connecticut have employed this strategy to equalize teacher salaries statewide to diminish regional inequalities (Bradley, 1998). Additional financial incentives (e.g., signing bonuses, differential salary schedules for high-need areas) may be required to retain teachers, especially in high-need subject areas. To improve teaching and student achievement, districts also should build career-advancement and knowledge- and skills-based compensation systems that support novice, career and accomplished teachers by rewarding increases in expertise. This should be integrated with recertification processes so that recertification is tied to increased capacity as well. Incentives beyond compensation, like mentoring programs for new educators, should be implemented to attract and retain high quality teachers. Effective teaching requires initial support, career advancement opportunities, and ongoing professional learning beginning with a teacher's first year in the profession.

Professional Learning

The framers of the NCLBA emphasized that high-quality teachers must receive high-quality preparation and professional development, or "professional learning" (National Staff Development Council, 2001). Professional learning must become a major focus of a state's reform agenda if teacher capacity to increase student learning is going to improve. Ferguson (1991) demonstrated that differences in teacher expertise (as measured by teacher education, licensing examination scores, and experience) account for more variation in student achievement than any other school factor and that every additional dollar spent on more qualified teachers nets greater increases in student achievement than funds spent on other less instructionally-focused resources. Additionally, after controlling for socioeconomic factors, disparities in achievement between black and white students are almost entirely explained by differences in teacher qualifications.

The "ideal" rural teacher holds certification in more than one subject area or grade level, is able to teach a wide range of student abilities in the same classroom, is able to supervise extracurricular activities, and can adjust to the community (Collins, 1999; Lemke, 1994; Stone, 1990). Additionally, the NCLBA requires that all teachers be fully certified in their teaching field by 2005-2006 and supports districts' investment in ongoing professional development. Increasing teacher expertise in rural schools cannot be accomplished by focusing on individual teachers; it must be

carried out by an efficient system based on current research on learning. Institutions and agencies involved in a system of professional learning will need to coordinate their efforts to create a carefully articulated approach that meets both student achievement and teacher quality requirements of the federal legislation. This system must focus on preservice education, certification, advanced education, and professional development.

In Wyoming, total demand for teachers is estimated to remain at current levels (Reichardt, 2001a). Even if demand for teachers remains steady, the state and school districts will need to find ways to support the development of current and future teachers faced with increasing student achievement expectations of the NCLBA. Average scores for the first 3 years of the Wyoming Comprehensive Assessment System (WycAS) (1999, 2000, and 2001) reveal that in all but two of the nine content areas tested (reading, writing, and mathematics at three grade levels) the majority of Wyoming's 4th, 8th, and 11th grade students scored below "proficient." The only two areas for which more than half of the students performed at the proficient level or above were 8th and 11th grade writing (51% of 8th graders and 56% of 11th graders scored at or above the proficient level). An examination of research on preservice education, certification, advanced education, and professional development in Wyoming points out areas which need to be addressed in order to build a comprehensive system of professional learning that supports teachers in achieving the NCLBA goals.

Preservice Education

A survey study of special education staffing in Wyoming (Manley, 1998) found that the University of Wyoming College of Education preservice and continuing education offerings were not fully preparing and meeting the needs of Wyoming educators in relation to special education. These findings were in accord with the results of an evaluation conducted by the College of Education with its 1996-1998 teacher education graduates who were teaching full time in 2000. Paradis and Stone (2000) found that a randomly selected sample of 20 education graduates from the classes of 1996, 1997, and 1998 (60 total) and their principals felt they were well prepared to teach, but that they needed more extensive preparation in special education, standards-based education, and in actual classrooms. These studies indicate that to improve teaching quality, in-state preservice preparation programs need to better address areas directly related to all students meeting standards.

Certification

The number of teachers in positions for which they are not fully certified or endorsed another important mea-

sure of teaching quality, even though the link between certification and teaching quality is highly debated (Darling-Hammond, 2000). Certification for teachers in Wyoming is based on meeting certification standards. The vast majority of Wyoming teachers (96%) hold certification in the fields in which they are teaching (Reichardt, 2001a; Smith, 2001). The Wyoming Professional Teaching Standards Board offers a number of alternative certification routes for those who do not have the credentials to meet certification standards. These alternative certification routes include portfolio and provisional certifications. Portfolio certification allows individuals to submit a collection of evidence that demonstrates their competencies in appropriate certification or endorsement standards. It has become an increasingly popular route to certification with 36 approved portfolios from 1997 through 2001 and 21 approved portfolios in 2001 alone.

Provisional certifications (waiver, temporary, collaboration, transitional) are available for teachers who are working in positions for which they do not meet certification standards but who hold certification in another teaching field or who hold a bachelor's degree in the field they are teaching. The 2000-2001 total provisional certifications (404) represented 6% of the full-time teacher workforce, a 146% increase in number since 1996. Thirteen percent of speech pathologists, 7% of foreign language teachers, 6% of special educators, and 4% of counselors held provisional certifications during the 2000-2001 school year. Like the proportion of unfilled positions (see Recruitment Strategies), teachers with provisional certifications were most prevalent in western regions of the state and in districts serving rural areas (Reichardt, 2001a) (see Table 6). Provisional certifications were more than twice as high in rural districts than in nonrural districts. With passage of the NCLBA, provisional certifications will be phased out by 2005-2006. This places increased pressure on the state and school districts to provide these rising numbers of provisionally certified teachers in the classroom the necessary training for them to meet certification standards.

Advanced Education

Although the Wyoming Professional Teaching Standards Board maintains rigorous standards for initial certification, recertification requires individuals to submit a plan for acquiring five continuing education credits every 5 years, which is the equivalent of 2 days of professional development per year. In addition, the likelihood that a Wyoming teacher will continue to pursue education at the graduate level is lower than for teachers nationally. In 2000-2001, only 27% of Wyoming teachers had master's degrees (Reichardt, 2001a), compared to 45% nationally (National Center for Education Statistics, 2001). Locale and regional geography in Wyoming were important factors in relation

Table 6
Proportion Provisionally Certified Teachers by Region

| | 1996 | 2000 |
|------------------|------|------|
| Rural | 2% | 8% |
| Small Town | 2% | 6% |
| City/Large Towns | 2% | 4% |
| Northwest | 2% | 8% |
| Northeast | 2% | 4% |
| Southwest | 2% | 8% |
| Southeast | 1% | 3% |
| Central | 2% | 6% |

Source: Reichardt (2001a)

to the advanced education levels of teachers. Rural schools were least likely to have teachers with master's degrees (18%), while schools in cities/large towns were most likely to have them (36%). Not surprisingly, the southeastern region of the state, where the university is located, had the highest concentration of teachers with master's degrees (35%). The Southwest had the lowest concentration (19%). School size was also related to the proportion of teachers with master's degrees. Small schools had fewer teachers with master's degrees (17%) than larger schools (31%).

As has been found in other states, there is an inverse relationship between the proportion of poor students and teachers with master's degrees. Schools with more poor students have fewer teachers with master's degrees (Lewis et al., 1999). Wyoming schools with less than 25% free- and reduced-lunch eligible students have the largest proportion of teachers with master's degrees (30%) while schools with 75% and above free- and reduced-lunch students have the smallest proportion of teachers with master's degrees (25%).

Professional Development

Current standards for professional development published by the National Staff Development Council (2001) indicate that effective professional development is focused on learning in collaboration with colleagues in professional work settings. It aims not only to increase the knowledge, skills, and dispositions of individual teachers, but it also focuses on creating school-wide professional learning communities" (Fullan, 2001, p. 64). Schools must change as organizations as the individuals in those schools change.

In 1999, Sachse and Manley (1999) reported that just under 50% of Wyoming teachers reported receiving 3 hours or less of professional development per month. The third

most frequently cited professional development issue for teachers was their concern about workload. Wyoming administrators identified the most overwhelming barrier to providing quality professional development as a lack of time. Close to 30% of teachers cited no specific time provided for professional development in their schools.

The degree to which districts invest in professional development also is a critical indicator of their commitment to providing both the time and the resources necessary to improve teaching quality. The National Staff Development Council recommends that school districts dedicate 10% of their operating budgets to high quality professional development. Holloway (2001) reported that between 1997 and 2000, on average less than one quarter of Wyoming's school districts devoted 1.5%⁵ of their state-funded budgets to professional development activities for teachers. All Wyoming school districts receive some federal dollars, some of which must be used for professional development. Examining expenditures for professional development from districts' total budgets (state, local and federal) revealed that districts spent an average of 1.6% of their total budgets on professional development. In terms of providing reimbursement for professional development opportunities, districts are most likely to reimburse teachers for conference attendance (63%) and for summer work (54%). However, quality professional development has not been shown to consist of conference attendance or independent summer work.

Over the past 3 years, considerable support for large-scale teacher professional development has emerged among state agencies and institutions in Wyoming. However, effective large-scale professional learning is expensive. Professional development for the majority of Wyoming teachers most often is provided by districts on inservice days, in lecture-style, without follow-up, and infrequently from one to four sessions per year (Sachse & Manley, 1999). Research on effective professional development indicates that to improve student achievement, professional development must be (a) responsive to school goals as well as individual teacher needs, (b) imbedded in the context of the daily work of teachers, and (c) an ongoing and reflective effort.

Investing in high quality professional development is a commitment to both adult and student learning. In addition to large-scale programs, it requires school- and district-level programs built upon accepted standards for teaching as well as sufficient time and resources (Darling-Hammond, 2000). For Wyoming's small and rural schools

⁵Holloway (2001) compares district expenditures for professional development from districts' general (state and local) and federal budgets with the estimated funding for professional development in the state funding model, 1.5% of a district's total block grant.

and districts, multiple school and district programs should be considered. This will require incentives for districts to build school capacity by restructuring school organization of time and resources in ways that support the learning of all staff and students. According to Newmann, King, and Young (2000), for schools to become especially effective, school "capacity" is the key. This capacity consists of five components: (a) teachers' knowledge, skills, and dispositions; (b) professional community; (c) program coherence; (d) technical resources; and (e) principal leadership. To build capacity in Wyoming schools, an integrated system of professional learning needs to be coordinated among state agencies, institutions of higher education, and school districts to ensure that all teachers and leaders receive the professional support they need to be effective. This system needs to be aligned to a common set of teaching and professional development standards (e.g., Interstate New Teacher Assessment and Support Consortium, 1992; National Board for Professional Teaching Standards, 1999; National Council for the Accreditation of Teacher Education, 1997; National Staff Development Council, 2001) and should be assisted by increased technology use via the Internet with threaded discussion boards, on-line courses and resources, and the statewide video conferencing systems.

An example of this type of collaboration is the establishment of three partnerships among the university, community colleges, and school districts as Professional Development Schools (PDS) sites. These regional programs address preservice and inservice professional learning needs. These sites are located in high-need areas of the state and are designed to prepare site-bound, college-through-post-graduate students to teach within local K-12 schools. A PDS also provides professional development opportunities for career public school and university teachers as well as mentoring and portfolio certification support for provisionally certified teachers.

A PDS is an actual school setting where both university and school faculty provide content and pedagogy courses; long-term clinical experiences, including internships; mentorship for provisionally-certified and novice teachers; professional development for K-16 teachers; and research opportunities to advance knowledge of teaching and learning in standards-based schools. Currently, 150 preservice teachers are working on teaching credentials at these sites. Half of these are minorities. Preliminary evaluation data suggest that these innovative programs have the potential to serve as regional professional learning centers. Recent legislative support to sustain and expand regional PDS offers a promising avenue for providing access to high-quality professional preparation and development for all educators, especially those in high-need rural areas.

Policy Recommendations

To ensure that all teachers are highly qualified in rural schools, opportunities for meeting certification requirements through both traditional teacher certification programs and innovative "grow your own" programs that are school-based and/or technologically assisted are necessary to address the needs of the increasing numbers of provisionally certified teachers and shortage areas. Rural schools need incentives and support to restructure the scheduling of time and distribution of resources to support professional development of all staff and to increase their capacity to achieve high levels of student learning. This may include state and district requirements to lengthen teacher noncontact contract days to build time for professional development needs. To establish a coordinated learning system for preservice through inservice education professionals, a comprehensive action plan that supports extensive collaboration among all partners—state agencies, universities, community colleges, school districts, and the business community—must be designed and implemented.

Conclusion

If predictions play out, Wyoming's future teacher quality issues are less likely to focus on filling widespread vacancies and are more likely to be concern with staffing classrooms with highly qualified teachers. Teachers trained and certified for positions in particular subject areas and who effectively educate diverse populations of students to high standards are needed, especially in rural areas, small schools, and western regions of the state. Rural and small schools are facing the largest challenges in recruiting and retaining quality teachers, especially beginning teachers and those with masters degrees, despite higher salaries in rural areas. As in other states, the systematic school reform effort in Wyoming has placed increased demands on the capacity of teachers and schools to retool teaching practices. Even though the university and the state have instituted a number of teacher quality initiatives, as Manley (2000) pointed out, "Thus far, they have been relatively underutilized . . . and have been confined to just a few settings" (p. 25). School districts have neither invested appropriately in increasing teacher capacity through professional learning opportunities nor implemented up-to-date recruitment strategies, including widely implemented incentives.

By going beyond state averages, this study illuminates the complexity of recruitment, retention, and professional learning issues in states with large numbers of rural schools. Aggregated data at the state level often obscure the subtle distinctions among teacher quality indicators across regions and locales, glossing over the differences that exist for rural schools in comparison to their more urban counterparts. Disaggregating teacher quality data by local and region

points out that a single policy solution, for example, is unlikely to solve the teacher quality issues faced by rural schools. In Wyoming advocating for higher salaries to attract teachers to rural schools may not be sufficient since beginning teachers tend to transfer from rural schools and existing higher salaries to more urban schools with lower salaries.

As Arnold (2000) said, "In order to adequately address the challenges facing rural schools, states should develop a coherent plan for crafting a *package* of solutions that addresses as many of the dimensions of the problem as possible" (p. 4). The policy recommendations presented in the preceding sections are an effort to create such a "package of solutions" for addressing the multiple dimensions of teacher quality issues in rural states. Combined these policy recommendations address the multidimensionality of recruitment, retention, and professional learning issues for rural schools.

Two issues this article does not address, why teachers choose to work where they do or why they choose to leave positions, are due to a lack of reliable data addressing these issues. Additionally, this article does not directly link improvements in teacher quality to specific student achievement gains because the WyCAS does not report student achievement scores by individual teachers. Considering that Wyoming students have made noteworthy progress on neither the WyCAS over the past 4 years nor the National Assessment of Educational Progress over the last decade, addressing recruitment, retention, and professional learning issues appears essential. Yet, for states that can link student achievement data with teacher quality indicators, more robust analyses may result from which policies in this area could be developed.

To ensure that all schools have access to effective research-based teacher quality strategies and that they have an adequate supply of high-capacity teachers, strong collaborative relationships among higher education, districts, certification boards, and state departments of education must be developed. Partner organizations will have to come together to devise and implement joint action plans and policies for enhancing the quality of teaching and leadership. This is especially important in rural states that have decreasing populations and thus declining resources. It requires a statewide, integrated approach to recruitment, retention, and professional learning that expands access to preparation, certification, and professional development opportunities. It is essential for meeting the requirements of the NCLBA. This will demand effective uses of interactive technologies to facilitate both adult and student learning by helping to forge the physical distances between all education partners. It also requires an effective statewide package of policies focused on improving the quality of both teaching and learning in all schools.

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